Internal Use Only
website:http://biz.LGservice.com

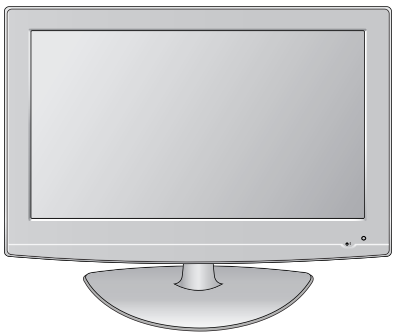
LG

LCD TV
SERVICE MANUAL

CHASSIS : LD84A

MODEL : 32LG5000 32LG5000-ZA
32LG5010 32LG5010-ZD
32LG5020 32LG5020-ZB
32LG5030 32LG5030-ZE

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Replacement Parts List.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

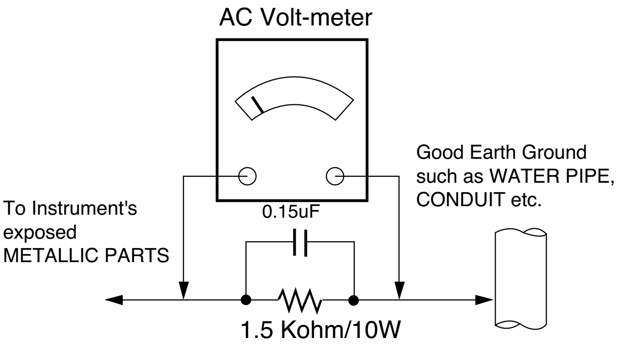
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
   Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LD84A chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature : 25±5°C (77±9°F), CST : 40±5°C
2) Relative Humidity : 65±10%
3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: CE, IEC specification
   - EMC: CE, IEC

Model	Market	Appliance
32LG5000-ZA	EU(PAL market)	Safety : IEC/EN60065 EMI : EN55013 EMS : EN55020

4. Module general specification

Item	Specification	Remark
Display Screen Device	32” wide Color Display Module	LCD
Aspect Ratio	16:9	
LCD Module	32” TFT LCD HD	LG5000 MAKER : 32”- CMO
Operating Environment	Temp. : 0 ~ 40 deg Humidity : 0 ~ 85%	LGE SPEC
Storage Environment	Temp. : -20 ~ 60 deg Humidity : 0 ~ 85 %	
Input Voltage	100 - 240V~, 50/60Hz	
Power Consumption	Power on (Green)	
	32” ≤ 130W (10.08 + 120 W)	LG5000 LCD + Backlight
Type Size	32” 760(H) x 450(V) x 47.4(D)	LG5000 With inverter
Pixel Pitch	32” 0.17025(H) x 0.51075 (V)	LG5000
Back Light	32” 16CCFL, Straight type	LG5000
Display Colors	16.7M (16,777,216)	
Coating	3H, AG	

5. Model general specification

Item	Specification	Remark
Market	EU (PAL Market-26 Countries)	**DTV & Analog** UK, France, Germany, Spain, Sweden, Finland, Italy, Netherland, Belgium, Luxemburg, Greece, Denmark, Czech, Austria, Hngary, Switzerland, Croatia, Turkey **Analog Only** Poland, Portugal, Norway, Bulgaria, Serbia, Slovenia, Russia, Romania
Broadcasting system	PAL-BG PAL-DK PAL-I/I’ SECAM L/L’ DVB-T(ID TV)	
Receiving system	Analog : Upper Heterodyne Digital : COFDM	
Scart Jack (2EA)	PAL, SECAM	Scart 1 Jack is Full scart and support RF-OUT(analog). Scart 2 Jack is Half scart and support MNT/DTV-OUT.
Video Input RCA(1EA)	PAL, SECAM, NTSC	4 System : PAL, SECAM, NTSC, PAL60
S-Video Input (1EA)	PAL, SECAM, NTSC	4 System : PAL, SECAM, NTSC, PAL60
Component Input(1EA)	Y/Cb/Cr Y/ Pb/Pr	
RGB Input(1EA)	RGB-PC	Analog (D-SUB 15PIN)
HDMI Input(3EA)	HDMI1-DTV/DVI HDMI2-DTV HDMI3-DTV	PC(HDMI version 1.3) Support HDCP
Audio Input(3EA)	RGB/DVI Audio Component AV	L/R Input
SPDIF out(1EA)	SPDIF out	
Earphone (1EA)	Antenna, AV1, AV2, AV3, Component, RGB, HDMI1, HDMI2, HDMI	
USB (1EA)		For service only

6. Component Video Input (Y, PB, PR)

No	Specification			Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	
1	720*480	15.73	60.00	SDTV, DVD 480i
2	720*480	15.63	59.94	SDTV, DVD 480i
3	720*480	31.47	59.94	480p
4	720*480	31.50	60.00	480p
5	720*576	15.625	50.00	SDTV, DVD 625 Line
6	720*576	31.25	50.00	HDTV 576p
7	1280*720	45.00	50.00	HDTV 720p
8	1280*720	44.96	59.94	HDTV 720p
9	1280*720	45.00	60.00	HDTV 720p
10	1920*1080	31.25	50.00	HDTV 1080i
11	1920*1080	33.75	60.00	HDTV 1080i
12	1920*1080	33.72	59.94	HDTV 1080i
13	1920*1080	26.97/27	23.97/24	HDTV 1080p
14	1920*1080	33.716/33.75	29.976/30.00	HDTV 1080p
15	1920*1080	56.250	50	HDTV 1080p
16	1920*1080	67.43/67.5	59.94/60	HDTV 1080p

7. RGB PC INPUT Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
1	720*400	31.468	70.08	28.321		
2	640*480	31.469 37.684	59.94 75.00	25.17 31.50	VESA	Input 848*480 60Hz, 852*480 60Hz -> 640*480 60Hz Display
3	800*600	37.879 46.875	60.31 75.00	40.00 49.50	VESA	
4	832*624	49.725	74.55	57.283	Macintosh	
5	1024*768	48.363 56.470 60.123	60.00 70.00 75.029	65.00 75.00 78.75	VESA(XGA)	
6	1280*768	47.78	59.87	79.5	WXGA	
7	1360*768	47.72	59.8	84.75	WXGA	
8	1366*768	47.56	59.6	84.75	WXGA	
9	1440*900	55.5	59.90	88.750	WXGA	19LG3000-ZA only
10	1400*1050	64.744	59.948	101.00	WSXGA	22LG3000-ZA only
11	1680*1050	65.16	59.94	147.00	WSXGA	22LG3000-ZA only
12	1280*1024	63.595	60.0	108.875	SXGA	FHD Model only
13	1920*1080	66.647	59.988	138.625	WUXGA	FHD Model only

8. HDMI DTV

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
1	720*480	15.734 / 15.6	59.94 / 60	27.00	SDTV 480I	
2	720*480	31.469 / 31.5	59.94 / 60	27.00/27.03	SDTV 480P	
3	720*576	15.625	50	27(54)	SDTV 576I	
4	720*576	31.25	50	54	SDTV 576P	
5	1280*720	37.500	50	74.25	HDTV 720P	
6	1280*720	44.96 / 45	59.94 / 60	74.17/74.25	HDTV 720P	
7	1920*1080	33.72 / 33.75	59.94 / 60	74.17/74.25	HDTV 1080I	
8	1920*1080	28.125	50.00	74.25	HDTV 1080I	
9	1920*1080	26.97 / 27	23.97 / 24	74.17/74.25	HDTV 1080P	
10	1920*1080	33.716 / 33.75	29.976 / 30.00	74.25	HDTV 1080P	
11	1920*1080	56.250	50	148.5	HDTV 1080P	
12	1920*1080	67.43 / 67.5	59.94 / 60	148.35/148.50	HDTV 1080P	

9. HDMI PC

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	720*400	31.468	70.08	28.321	HDCP	
2	640*480	31.469 37.684	59.94 75.00	25.17 31.50	VESA	HDCP
3	800*600	37.879 46.875	60.31 75.00	40.00 49.50	VESA	HDCP
4	832*624	49.725	74.55	57.283	Macintosh	HDCP
5	1024*768	48.363 56.470 60.123	60.00 70.00 75.029	65.00 75.00 78.75	VESA(XGA)	HDCP
6	1280*768	47.78	59.87	79.5	WXGA	HDCP
7	1360*768	47.72	59.8	84.75	WXGA	HDCP
8	1366*768	47.56	59.6	84.75	WXGA	HDCP
9	1440*900	55.5	59.90	88.750	WXGA	19LG3000-ZA only
10	1400*1050	64.744	59.948	101.00	WSXGA	22LG3000-ZA only
11	1680*1050	65.16	59.94	147.00	WSXGA	22LG3000-ZA only
12	1280*1024	63.595	60.0	108.875	SXGA	FHD Model only, HDCP
13	1920*1080	66.647	59.988	138.625	WUXGA	FHD Model only, HDCP

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LD84A chassis.

2. Designation

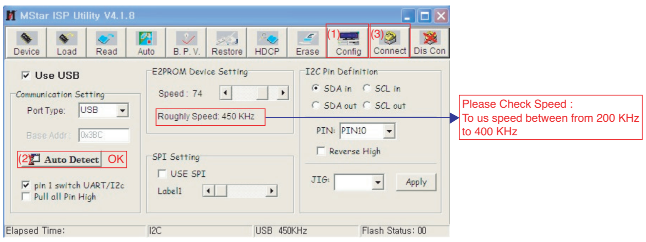
1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25±5°C
   Relative humidity : 65±10%
   Input voltage : 220V, 60Hz
6) Adjustment equipments: Color Analyzer (CA-210 or CA-110), Pattern Generator (MSPG-925L or Equivalent), DDC Adjustment Jig equipment, SVC remote controller
7) Don't push The "IN STOP KEY" after completing the function inspection.

3. Main PCB check process

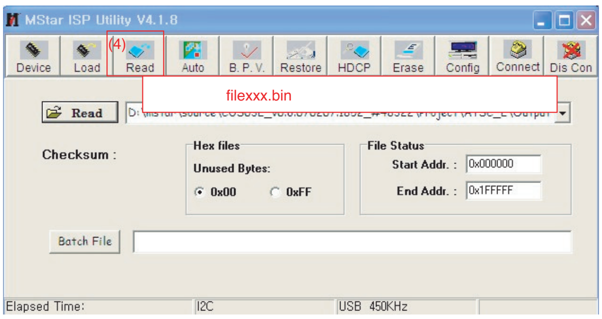
* APC - After Manual-Insult, executing APC

* Download

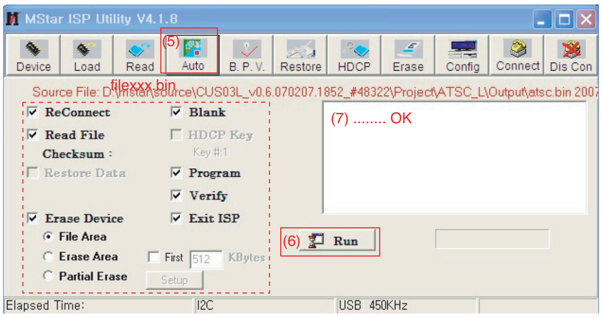
1) Execute ISP program "Mstar ISP Utility" and then click "Config" tab.
2) Set as below, and then click "Auto Detect" and check "OK" message. If display "Error", Check connect computer, jig, and set.
3) Click "Connect" tab. If display "Can't", Check connect computer, jig, and set.



4) Click "Read" tab, and then load download file(XXXX.bin) by clicking "Read".

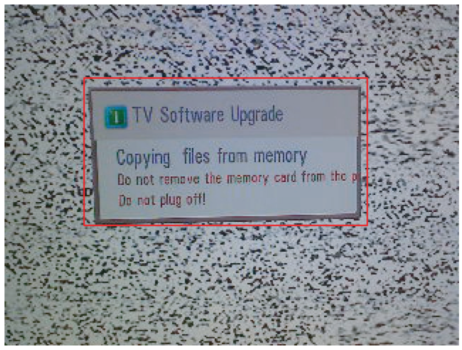


5. Click "Auto" tab and set as below
6. Click "Run".
7. After downloading, check "OK" message.

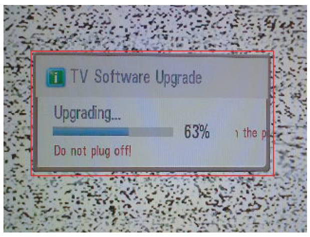


* USB DOWNLOAD

1) Put the USB Stick to the USB socket
2) Automatically detecting update file in USB Stick
   - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
3) Show the message "Copying files from memory"



4) Updating is staring.





5) Updating Completed, The TV will restart automatically.
6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

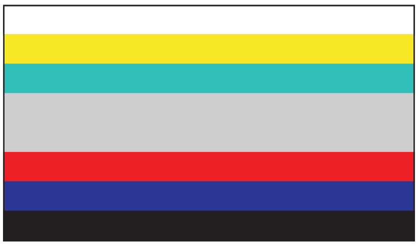
*** After downloading, have to adjust TOOL OPTION again.**

1) Push "IN-START" key in service remote controller
2) Select "Tool Option 1" and Punch in the number.(Each model has their number.)
   32LG5000-ZA : 8977
3) Completed selecting Tool option

3.1. ADC Process

(1) PC input ADC

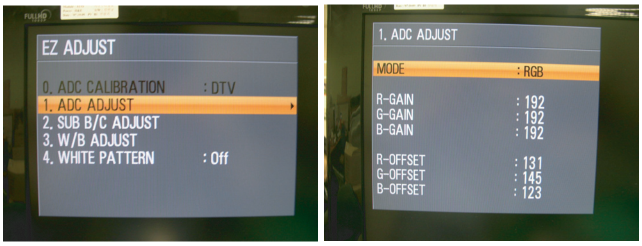
1) Auto RGB Gain/Offset Adjustment
   - Convert to PC in Input-source
   - Signal equipment displays
     Output Voltage : 700 mVp-p
     Impress Resolution XGA (1024 x 768 @ 60Hz)
     Model : 60 in Pattern Generator
     Pattern : 65 in Pattern Generator (MSPG-925 Series)



<Fig. 1> Adjustment pattern(PC)

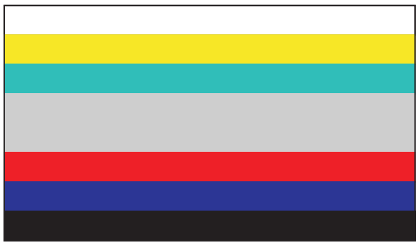
   - Adjust by commanding AUTO_COLOR_ADJUST.
2) Confirmation
   - We confirm whether “0xAA (RGB)” address of EEPROM “0xA2” is “0xAA” or not.
   - If “0xAA (RGB)” address of EEPROM “0xA2” isn’t “0xAA”, we adjust once more
   - We can confirm the ADC values from “0xA4~0XA9 (RGB)” addresses in a page “0xA2”

   * Manual ADC process using Service Remocon. After enter Service Mode by pushing “ADJ” key, execute “ADC Adjust” by pushing “►” key at “ADC CALIBRATION: RGB-PC”.



(2) COMPONENT input ADC

1) Component Gain/Offset Adjustment
   - Convert to Component in Input-source
   - Signal equipment displays
     Impress Resolution 480i
     MODEL : 209 in Pattern Generator(480i Mode)
     Pattern : 65 in Pattern Generator (MSPG-925 series)
     Impress Resolution 1080i
     Model : 223 in Pattern Generator(1080i Mode)
     Pattern: 65 in Pattern Generator(MSPG-925 series)



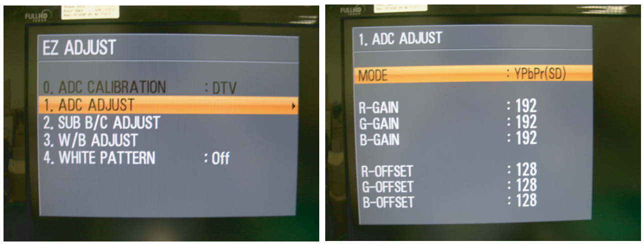
<Fig. 2> Adjustment pattern(COMPONENT)

   - Adjust by commanding AUTO_COLOR_ADJUST.

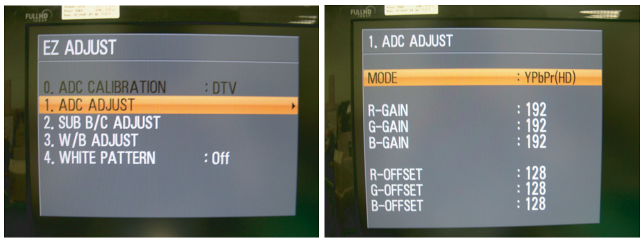
2) Confirmation
   - We confirm whether “0xB3 (480i)/0xBC (1080i)” address of EEPROM “0xA2” is “0xAA” or not.
   - If “0xB3 (480i)/0xBC(1080i)” address of EEPROM “0xA2” isn’t “0xAA”, we adjust once more.
   - We can confirm the ADC values from “0xAD~0XB2 (480i)/0XB6~BB (1080i)” addresses in a page “0xA2”.

   * Manual ADC process using Service Remocon. After enter Service Mode by pushing “ADJ” key, execute “ADC Adjust” by pushing “►” key at “ADC CALIBRATION :COMPONENT”.

   Impress Resolution 480i



   Impress Resolution 1080i



3.2. Function Check

(1) Check display and sound

- Check Input and Signal items. (cf. work instructions)
  1) TV
  2) AV (SCART1/SCART2/S-VHS/CVBS)
  3) COMPONENT (480i)
  4) RGB (PC : 1024 x 768 @ 60hz)
  5) HDMI
  6) PC Audio In
  * Display and Sound check is executed by Remote controller.

4. Total Assembly line process

4.1. Adjustment Preparation

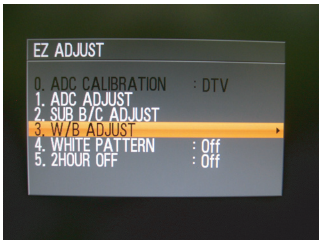
(1) W/B Equipment condition
CA210: CH 9, Test signal: Inner pattern (85IRE)
(2) Above 5 minutes H/run in the inner pattern. (“power on” key of adjust remote control)
(3) 15 Pin D-Sub Jack is connected to the AUTO W/B EQUIPMENT.
(4) Adjust Process will start by execute I2C Command (Inner pattern (0xF3, 0xFF).

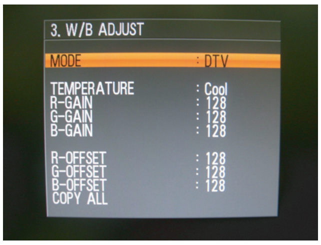
Color Temperature	Cool	11,000	°K	X=0.276(±0.002)	<Test Signal>
				Y=0.283(±0.002)	Inner patern
	Medium	9,300	°K	X=0.285(±0.002)	(216gray,85IRE)
				Y=0.293(±0.002)	
	Warm	6,500	°K	X=0.313(±0.002)	
				Y=0.329(±0.002)	

(5) Adjust Process will finish by execute I2C Command (Inner pattern (Inner pattern (0xF3,0x00)).

** Caution **
Color Temperature: COOL, Medium, Warm
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

* Manual W/B process using adjusts Remote control.
After enter Service Mode by pushing “ADJ” key,
Enter White Pattern off of service mode, and change off -> on.
Enter “W/B ADJUST” by pushing “▶” key at “3.W/B ADJUST”.





* After done all adjustments, Press “In-start” button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable.
If it is not same, then correct it same with BOM and unplug AC cable.
For correct it to the model’s module from factory JIG model.

* Don’t push The “IN STOP KEY” after completing the function inspection.

4.2. DPM operation confirmation

(Only Apply for MNT Model)
Check if Power LED Color and Power Consumption operate as standard.
- Set Input to RGB and connect D-sub cable to set
- Measurement Condition: (100~240V@ 50/60Hz)
- Confirm DPM operation at the state of screen without Signal

4.3 DDC EDID Write (RGB 128Byte)

- Connect D-sub Signal Cable to D-Sub Jack.
- Write EDID DATA to EEPROM (24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.

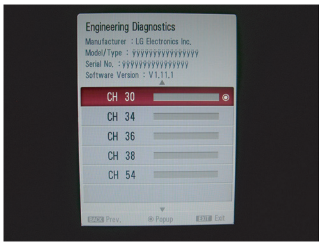
4.4. DDC EDID Write (HDMI 256Byte)

- Connect HDMI Signal Cable to HDMI Jack.
- Write EDID DATA to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.

4.5 Serial number (RS-232C)

- Press “Power on” key of service remocon. (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).





4.6. EDID DATA

(1) ANALOG DATA 128Byte (2Bi)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	EF	75	01	01	01	01
10	09	0F	01	03	01	46	27	78	EA	D9	B0	A3	57	49	9C	25
20	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	D1	B4
30	01	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88
40	35	00	BC	86	21	00	00	1C	26	38	80	A0	70	38	1F	40
50	50	20	85	00	BC	86	21	00	00	18	00	00	00	FC	00	33
60	32	4C	47	35	30	30	30	0A	20	20	20	20	00	00	00	FD
70	00	3C	4B	1D	43	0E	00	0A	20	20	20	20	20	20	00	AE

(2) DIGITAL DATA(HDMI-1) 256Byte

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	F0	75	01	01	01	01
10	07	11	01	03	80	46	27	78	EA	D9	B0	A3	57	49	9C	25
20	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	D1	C0
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	E8	26	32	00	00	1A	1B	21	50	A0	51	00	1E	30
50	48	88	35	00	BC	86	21	00	00	1C	00	00	00	FC	00	33
60	32	4C	47	35	30	30	30	0A	20	20	20	20	00	00	00	FD
70	00	32	4B	1C	43	0F	00	0A	20	20	20	20	20	20	01	98

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	23	F1	50	07	06	02	11	01	03	12	13	04	14	85
10	21	1F	20	22	10	23	09	07	07	83	01	00	00	65	03	0C
20	00	10	00	01	1D	00	BC	52	D0	1E	20	B8	28	55	40	C4
30	8E	21	00	00	1E	01	1D	00	72	51	D0	1E	20	6E	28	55
40	00	C4	8E	21	00	00	1E	01	1D	80	D0	72	1C	16	20	10
50	2C	25	80	C4	8E	21	00	00	9E	8C	0A	D0	90	20	40	31
60	20	0C	40	55	00	C4	8E	21	00	00	18	4E	1F	00	80	51
70	00	1E	30	40	80	37	00	BC	88	21	00	00	18	00	00	3B

(3) DIGITAL DATA(HDMI-2) 256Byte

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	F0	75	01	01	01	01
10	07	11	01	03	80	46	27	78	EA	D9	B0	A3	57	49	9C	25
20	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	D1	C0
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	E8	26	32	00	00	1A	1B	21	50	A0	51	00	1E	30
50	48	88	35	00	BC	86	21	00	00	1C	00	00	00	FC	00	33
60	32	4C	47	35	30	30	30	0A	20	20	20	20	00	00	00	FD
70	00	32	4B	1C	43	0F	00	0A	20	20	20	20	20	20	01	98

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	23	F1	50	07	06	02	11	01	03	12	13	04	14	85
10	21	1F	20	22	10	23	09	07	07	83	01	00	00	65	03	0C
20	00	20	00	01	1D	00	BC	52	D0	1E	20	B8	28	55	40	C4
30	8E	21	00	00	1E	01	1D	00	72	51	D0	1E	20	6E	28	55
40	00	C4	8E	21	00	00	1E	01	1D	80	D0	72	1C	16	20	10
50	2C	25	80	C4	8E	21	00	00	9E	8C	0A	D0	90	20	40	31
60	20	0C	40	55	00	C4	8E	21	00	00	18	4E	1F	00	80	51
70	00	1E	30	40	80	37	00	BC	88	21	00	00	18	00	00	2B

(4) DIGITAL DATA(HDMI-3) 256Byte

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	F0	75	01	01	01	01
10	07	11	01	03	80	46	27	78	EA	D9	B0	A3	57	49	9C	25
20	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	D1	C0
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	E8	26	32	00	00	1A	1B	21	50	A0	51	00	1E	30
50	48	88	35	00	BC	86	21	00	00	1C	00	00	00	FC	00	33
60	32	4C	47	35	30	30	30	0A	20	20	20	20	00	00	00	FD
70	00	32	4B	1C	43	0F	00	0A	20	20	20	20	20	20	01	98

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	23	F1	50	07	06	02	11	01	03	12	13	04	14	85
10	21	1F	20	22	10	23	09	07	07	83	01	00	00	65	03	0C
20	00	30	00	01	1D	00	BC	52	D0	1E	20	B8	28	55	40	C4
30	8E	21	00	00	1E	01	1D	00	72	51	D0	1E	20	6E	28	55
40	00	C4	8E	21	00	00	1E	01	1D	80	D0	72	1C	16	20	10
50	2C	25	80	C4	8E	21	00	00	9E	8C	0A	D0	90	20	40	31
60	20	0C	40	55	00	C4	8E	21	00	00	18	4E	1F	00	80	51
70	00	1E	30	40	80	37	00	BC	88	21	00	00	18	00	00	1B

1) All Data : HEXA Value
2) Changeable Data :
   *: Serial No : Controlled / Data:01
   **: Month : Controlled / Data:00
   ***:Year : Controlled
   ****:Check sum

4.7. HDCP (High-Bandwidth Digital Contents Protection) SETTING (Scaler : Mstar)

- Connect D-sub Signal Cable to D-Sub Jack
- Input HDCP key with HDCP-key- in-program
- HDCP Key value is stored on EEPROM (AT24C512) which is 0x80 addresses of 0xA0 page
- AC off/ on and on HDCP button of MSPG925 and confirm whether picture is displayed or not of using MSPG925
- HDCP Key value is different among the sets.

4.11 Outgoing condition Configuration

When pressing IN-STOP key by SVC remocon, Red LED are blinked alternatively. And then Automatically turn off. (Must not AC power OFF during blinking)

4.12 Internal pressure

Confirm whether is normal or not when between power board's ac block and GND is impacked on 1.5kV(dc) or 2.2kV(dc) for one second

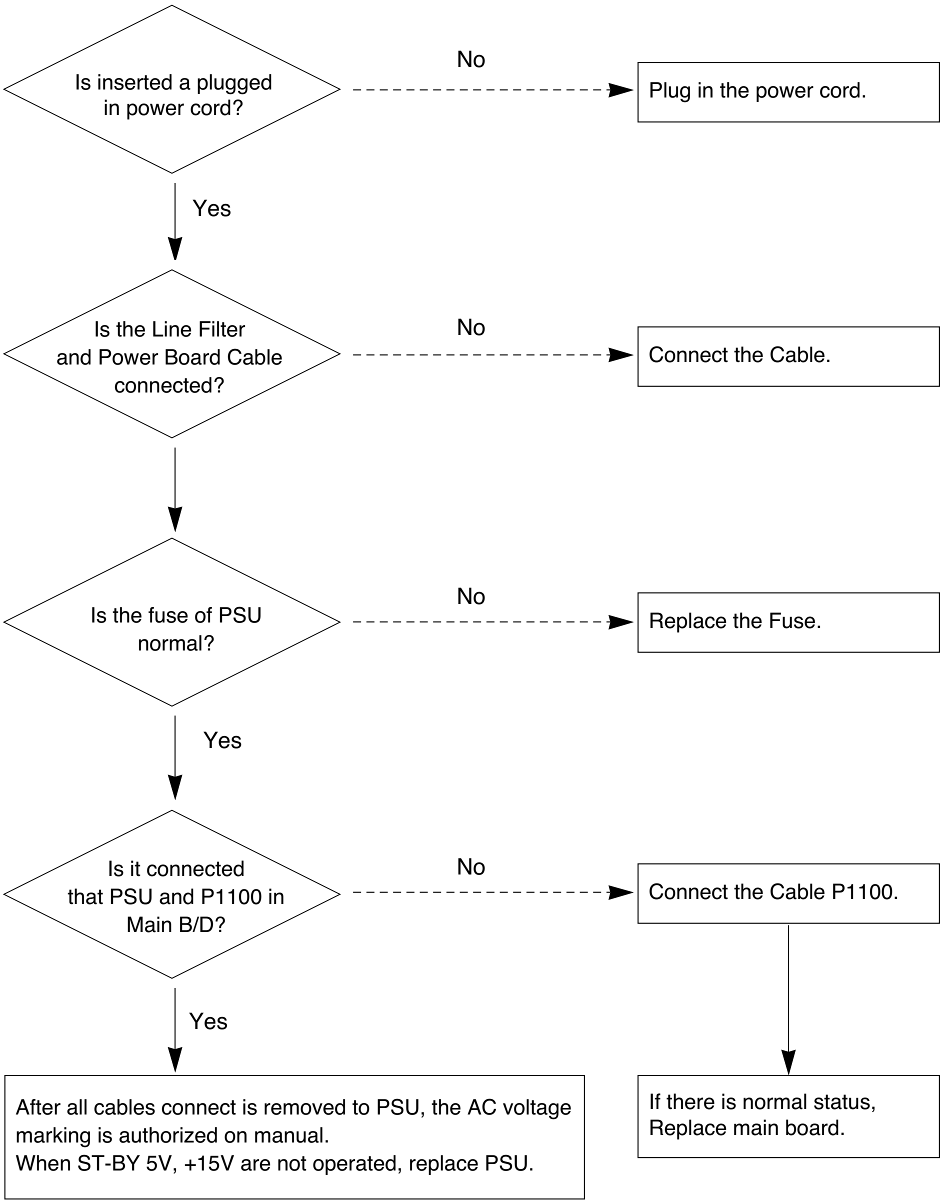
TROUBLESHOOTING

1. No Power

(1) Symptom

1) It is not discharged minutely from the module.
2) Light does not come into the front LED.

(2) Check process

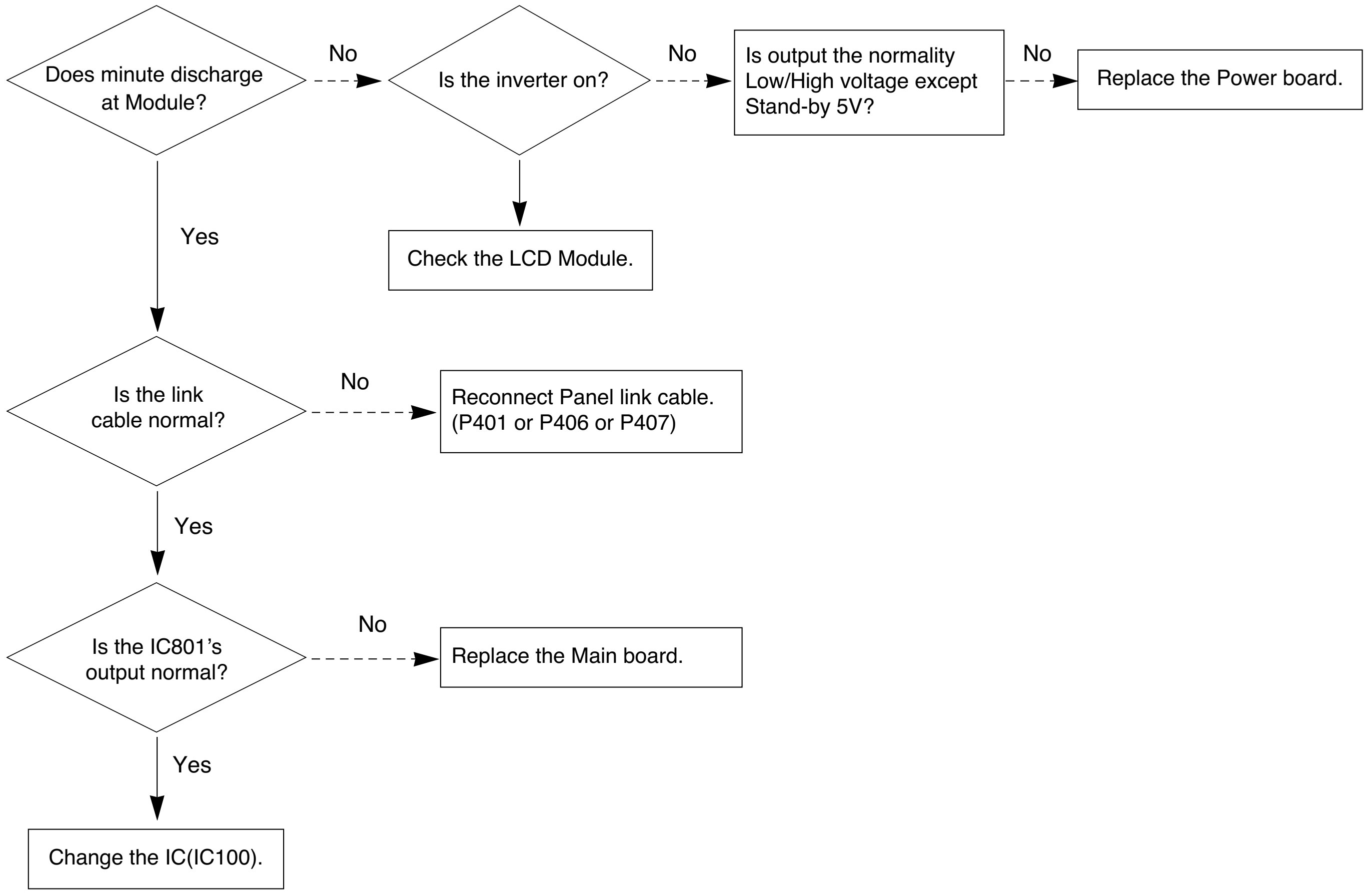


2. No Raster

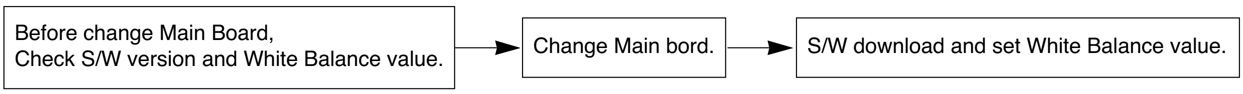
(1) Symptom

1) No OSD abnd image occur at screen.
2) It maintains the conditioon where the front LED is blue.

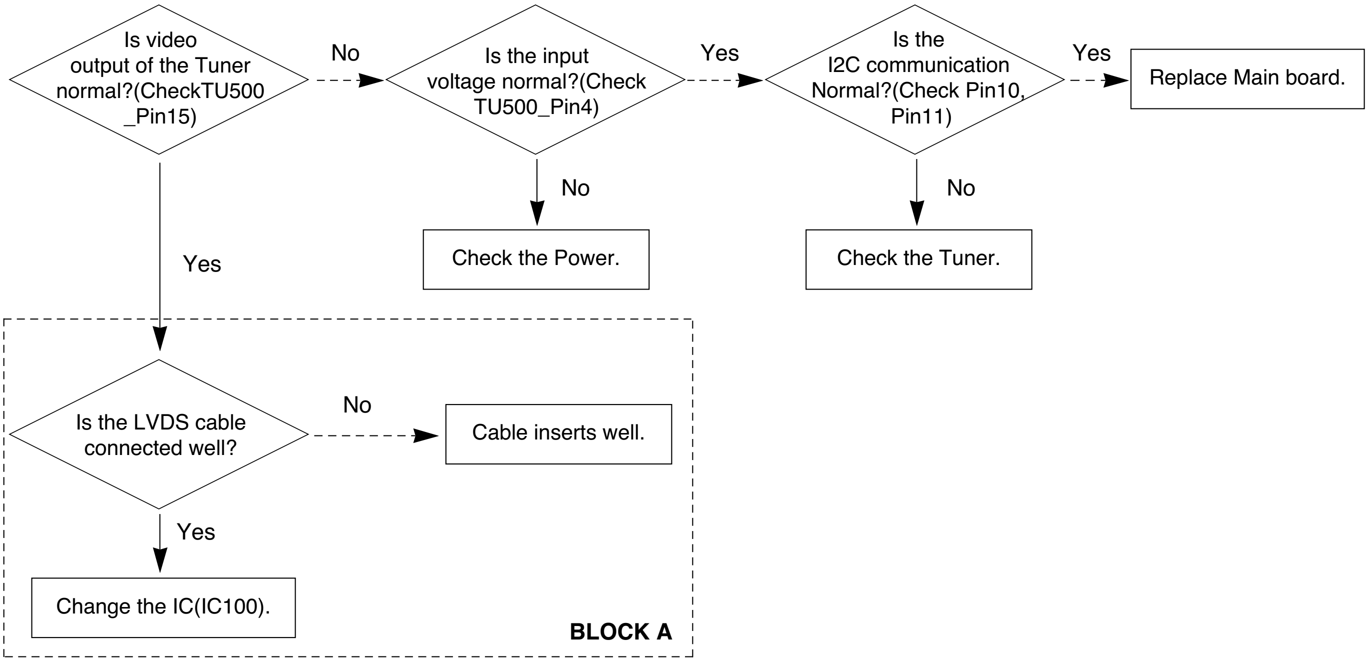
(2) Check process



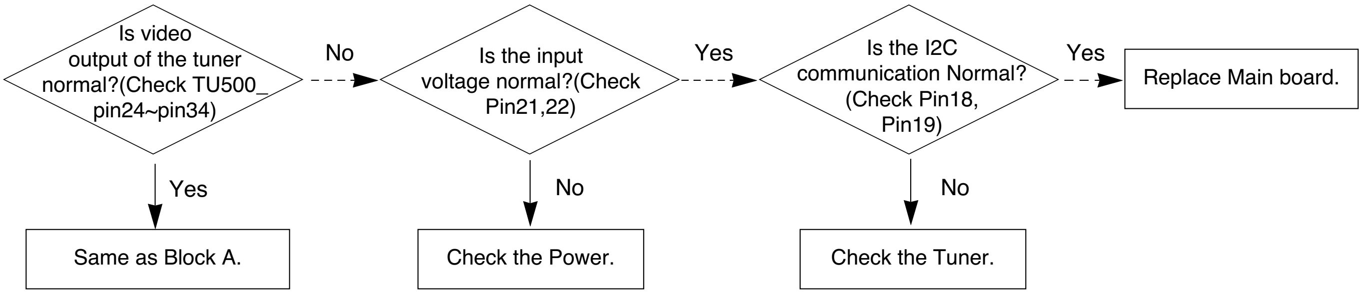
*** Caution**



3. Unusual display from TV/CATV mode

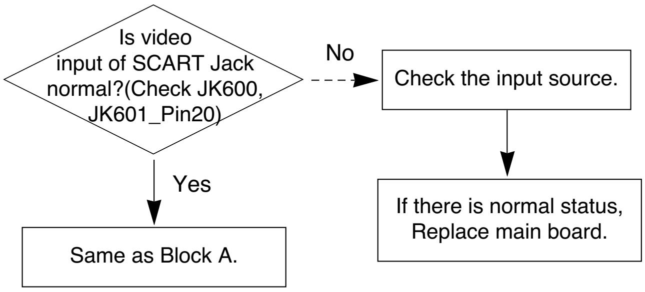


4. Unusual display from DTV mode

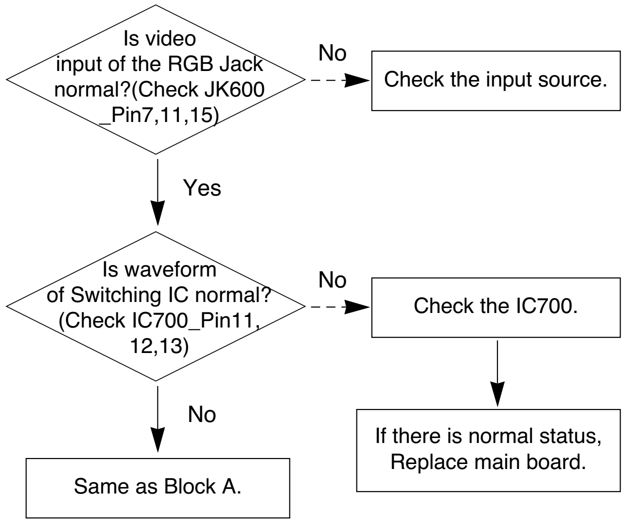


5. Unusual display from AV1/AV2(SCART) mode

- CVBS Input

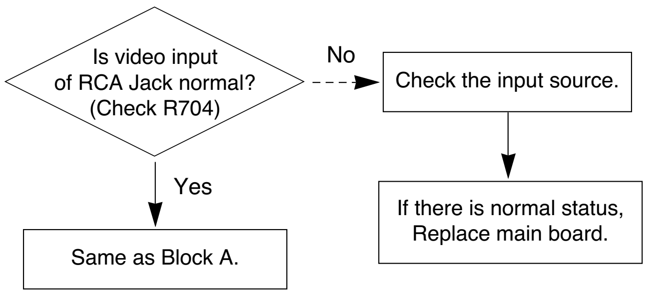


- RGB Input



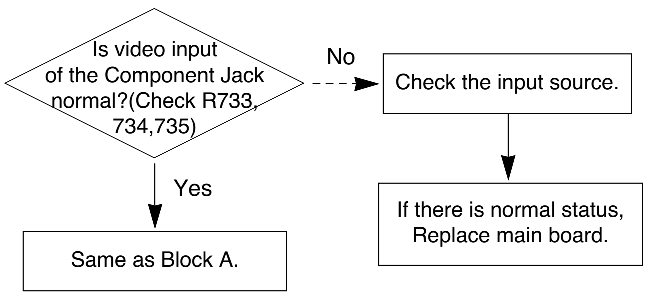
6. Unusual display from AV3(SIDE AV) mode

- CVBS Input

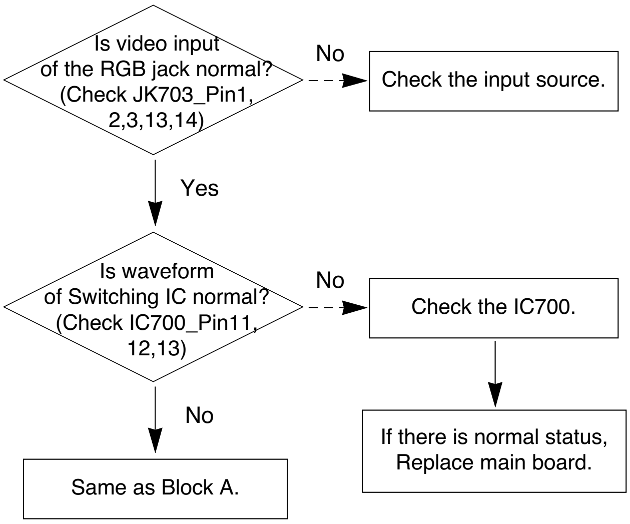


7. Unusual display from Component mode

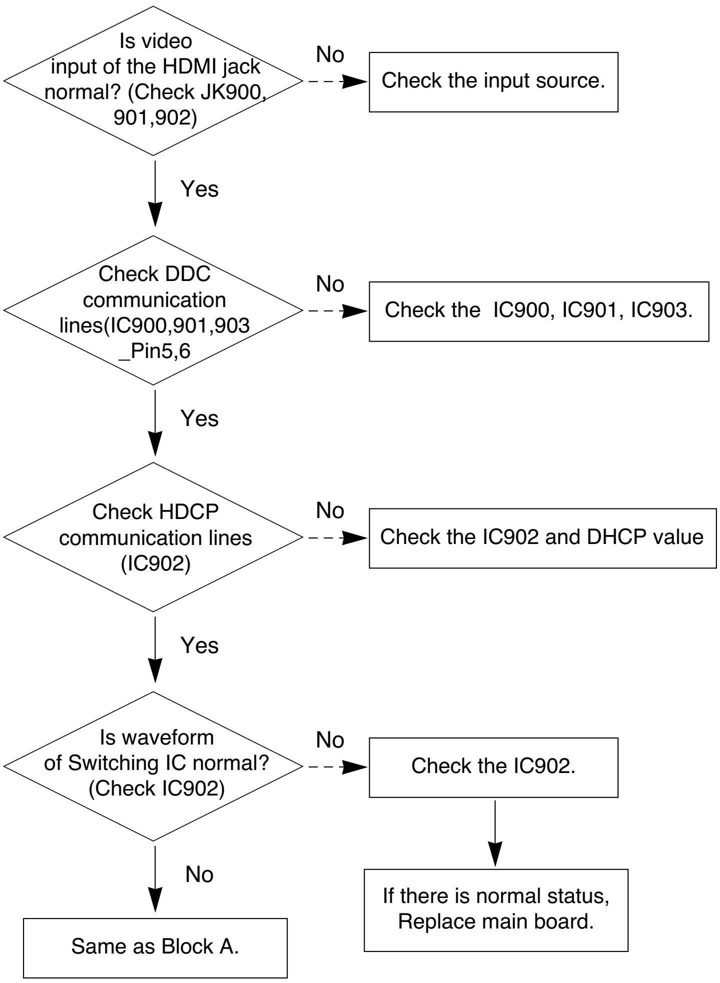
- CVBS Input



8. Unusual display from RGB mode



9. Unusual display from HDMI 1/2/3 mode

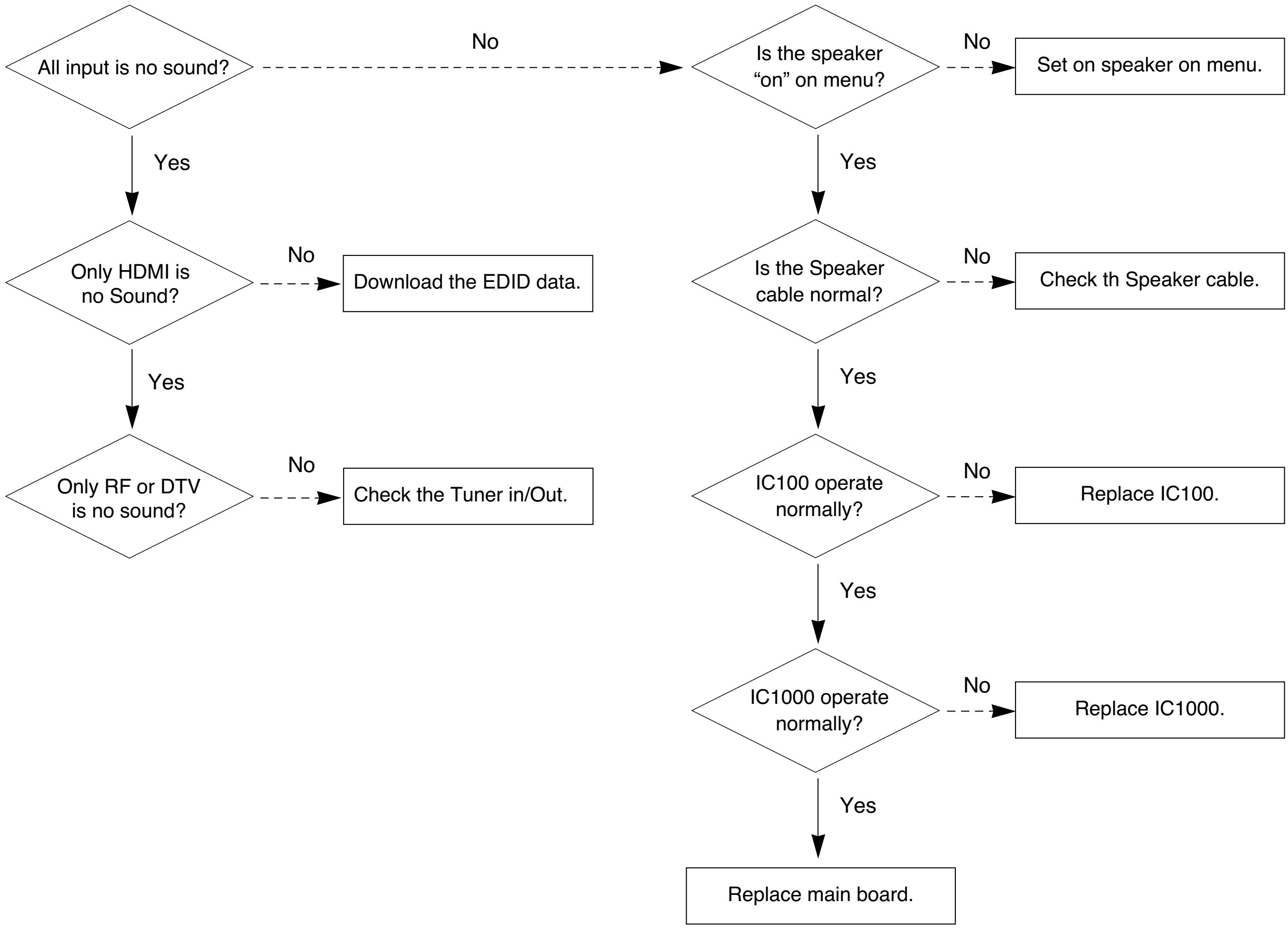


10. No Sound

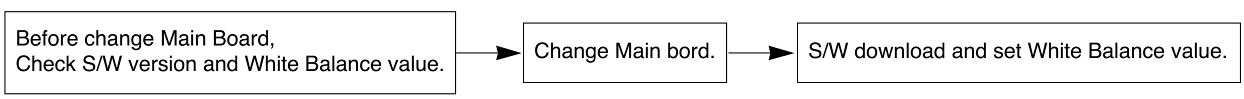
(1) Symptom

1) LED is blue
2) Screen display but sound is not output.

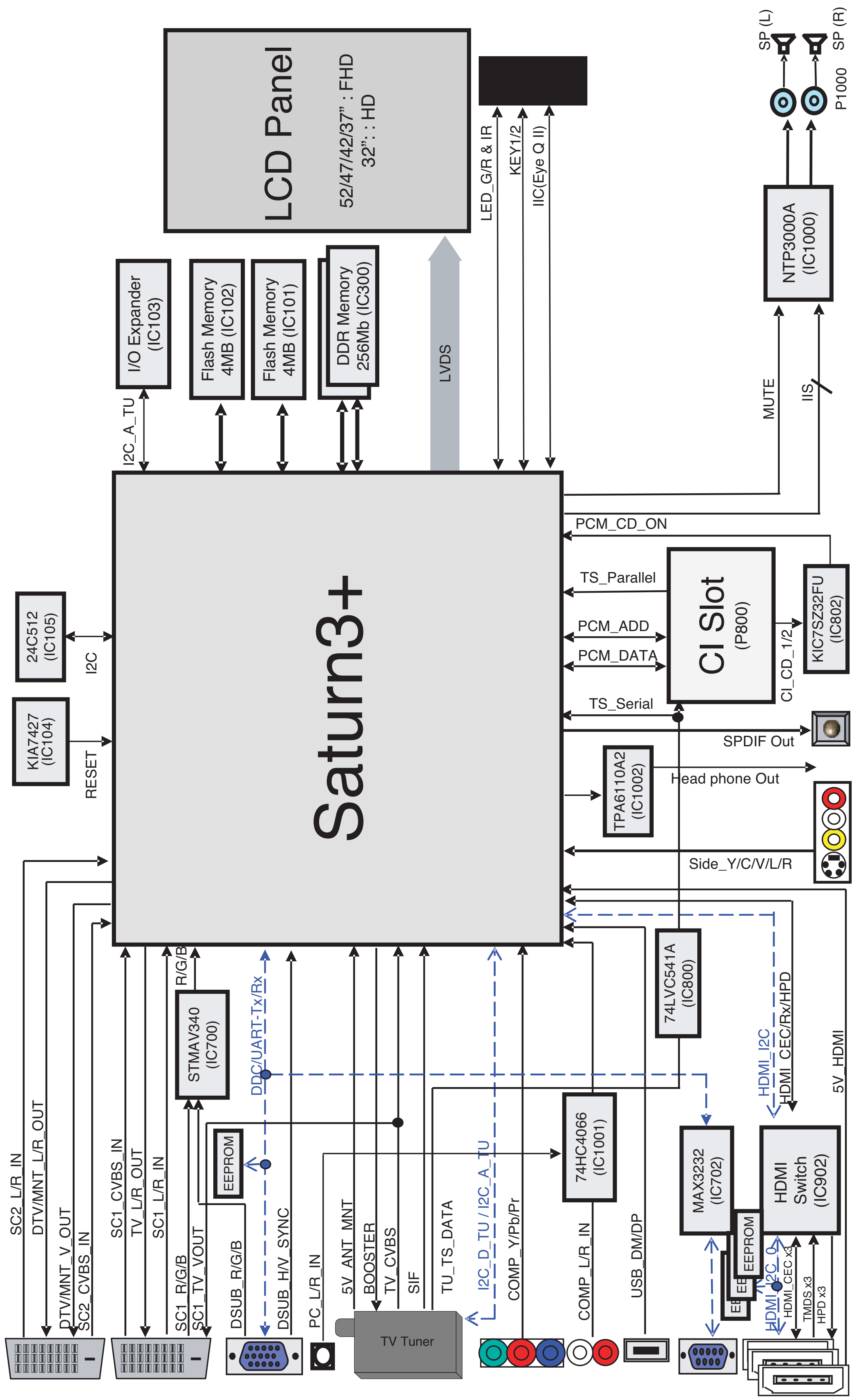
(2) Check process



*** Caution**

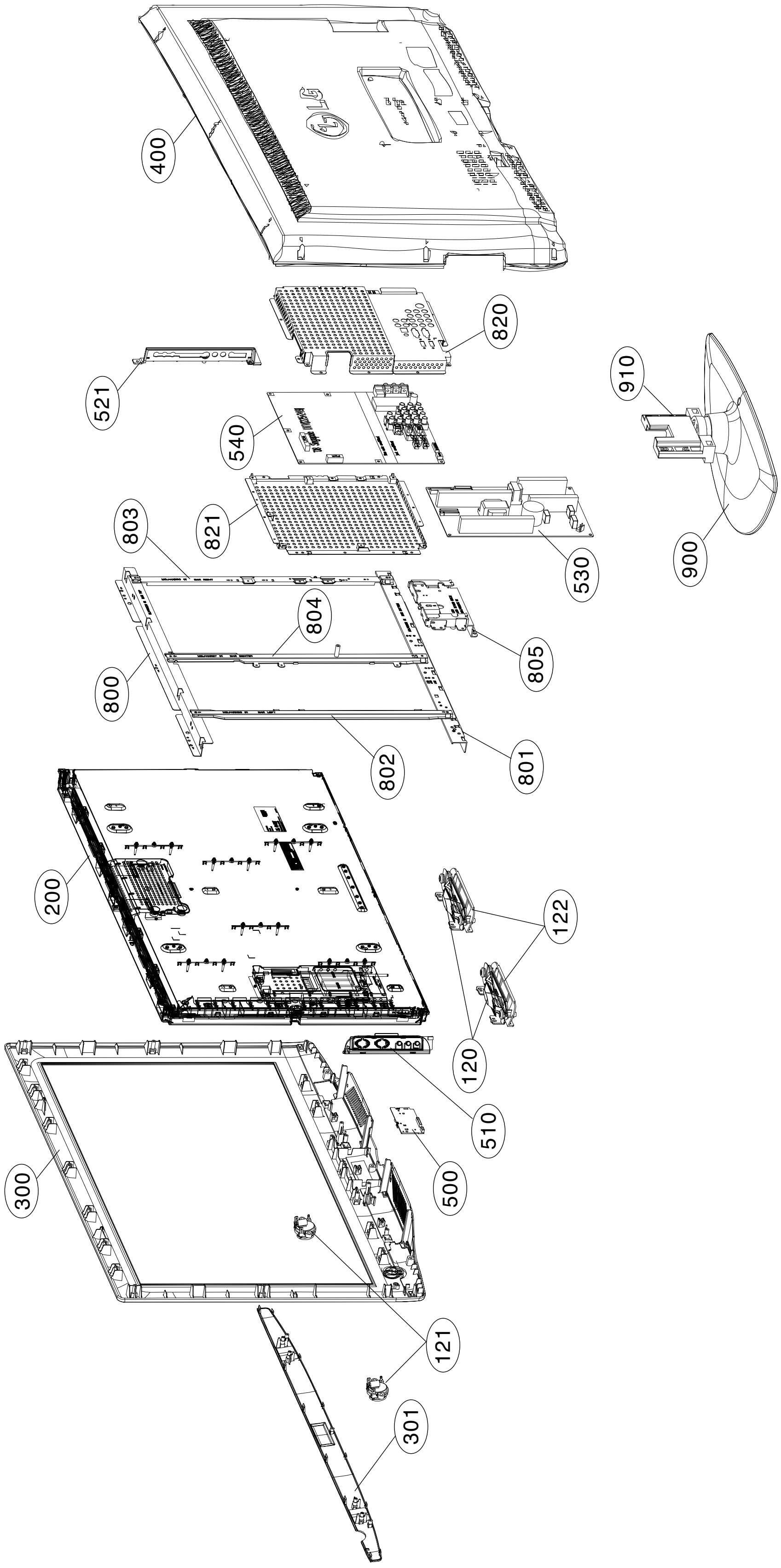


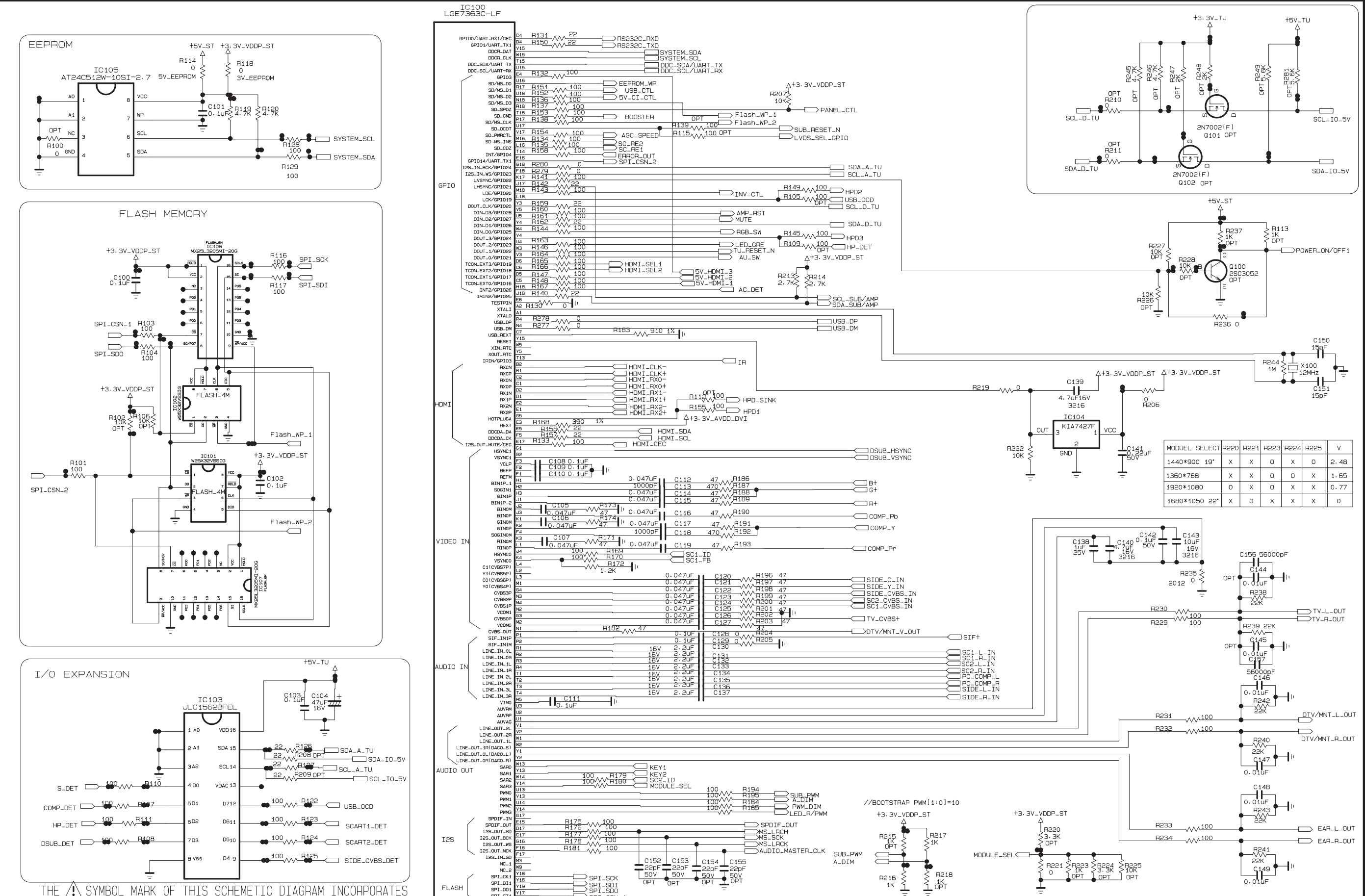
BLOCK DIAGRAM



MEMO

EXPLODED VIEW

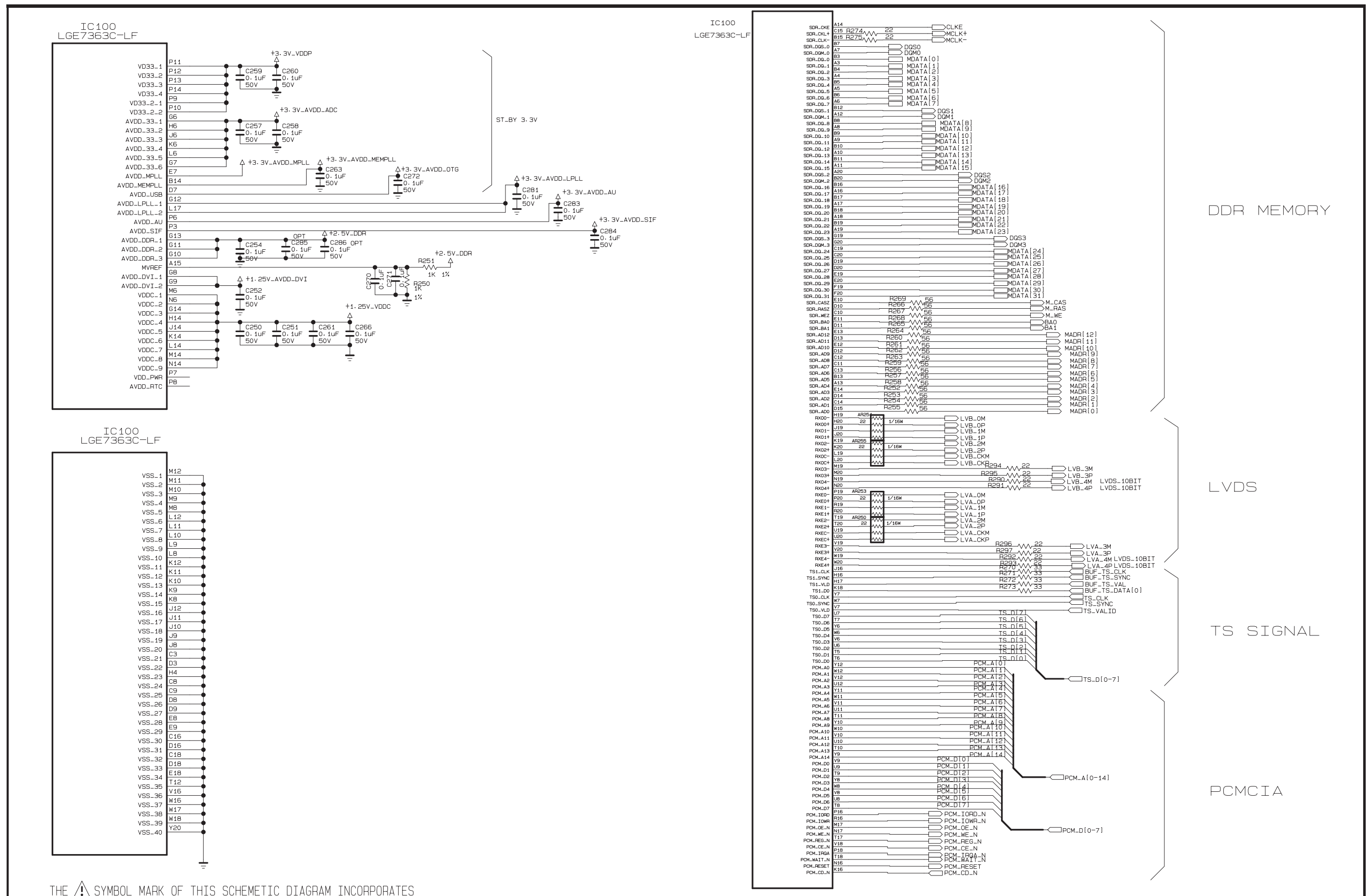




THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

LG ELECTRONICS

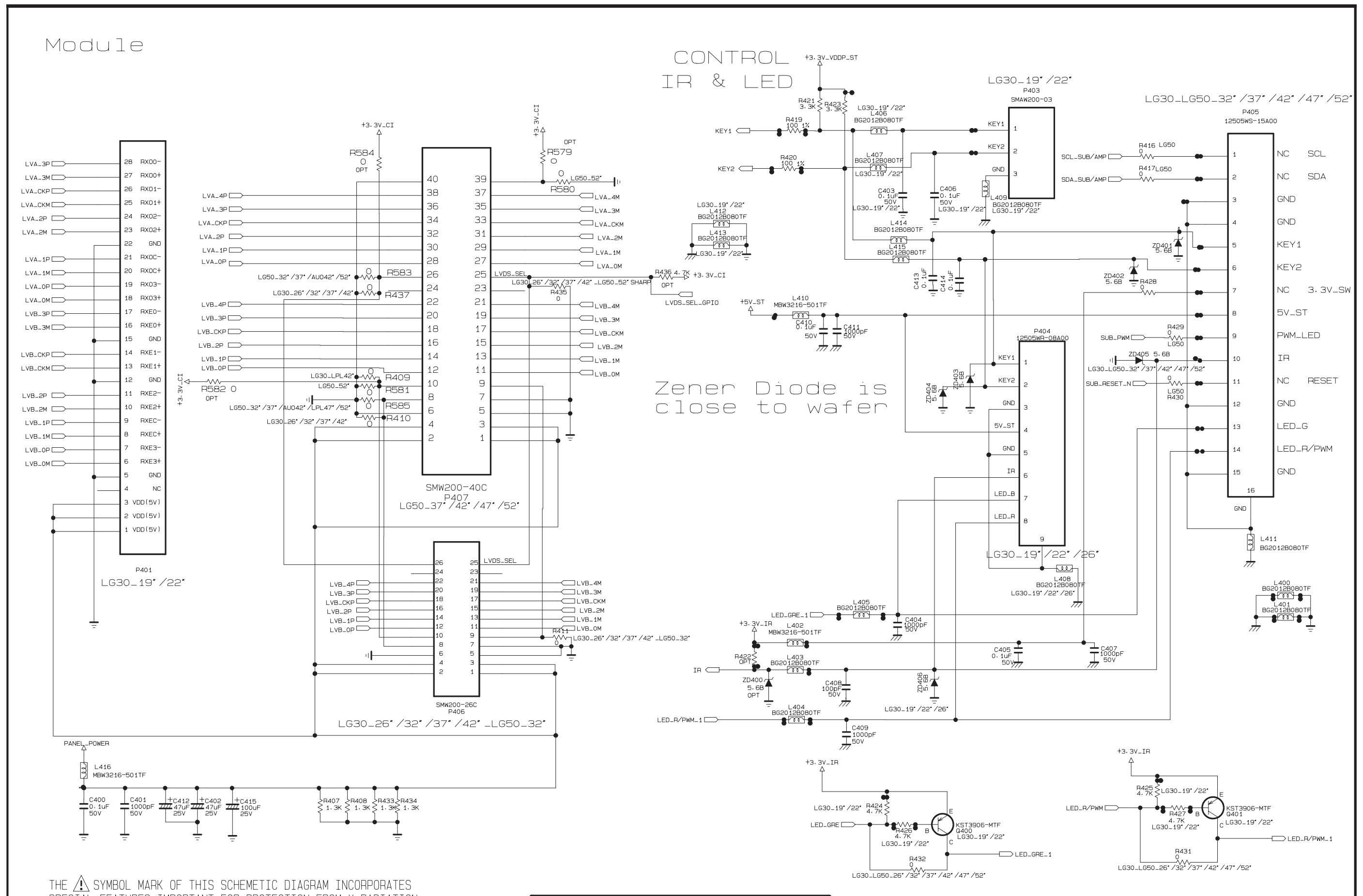
MODEL		DATE	2007. 12. 04
BLOCK	MAIN_1	SHEET	1 / 11



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

LG ELECTRONICS

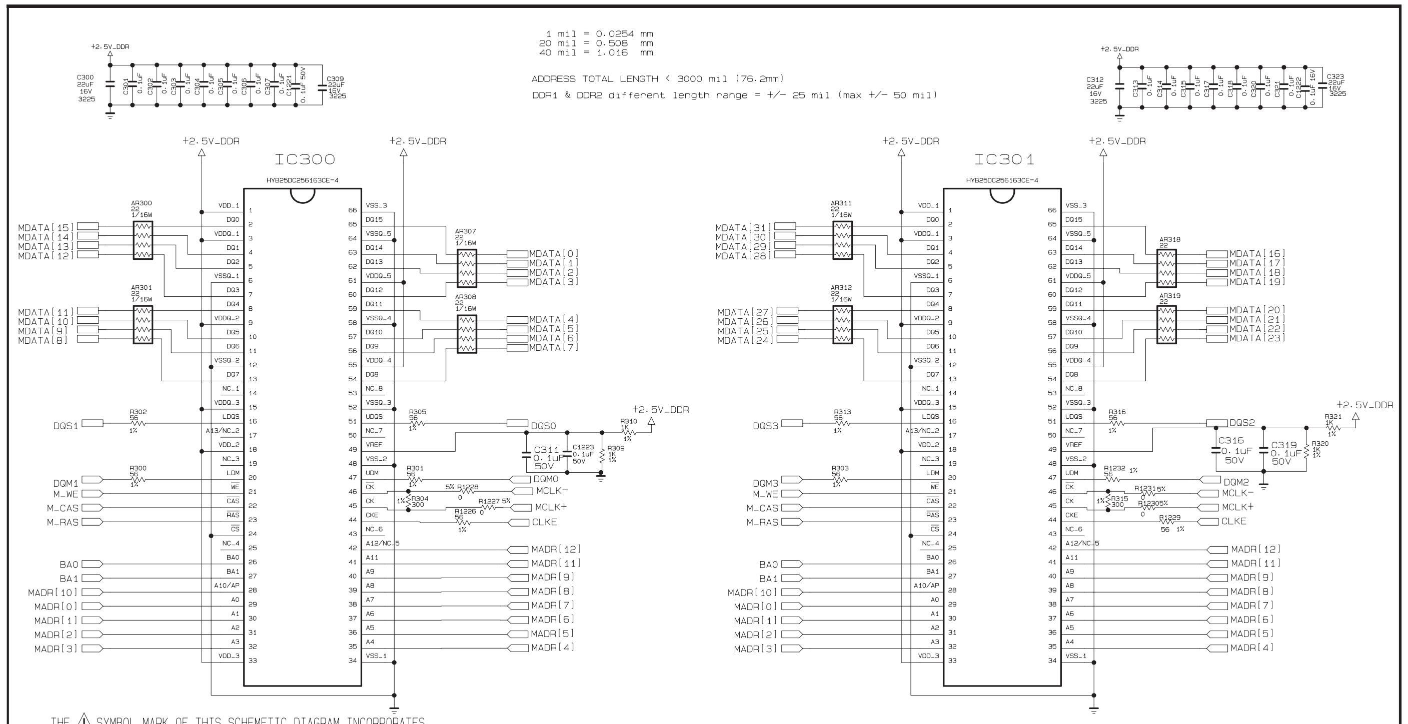
MODEL		DATE	2007. 12. 04
BLOCK	MAIN_2	SHEET	2 / 11



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

LG ELECTRONICS

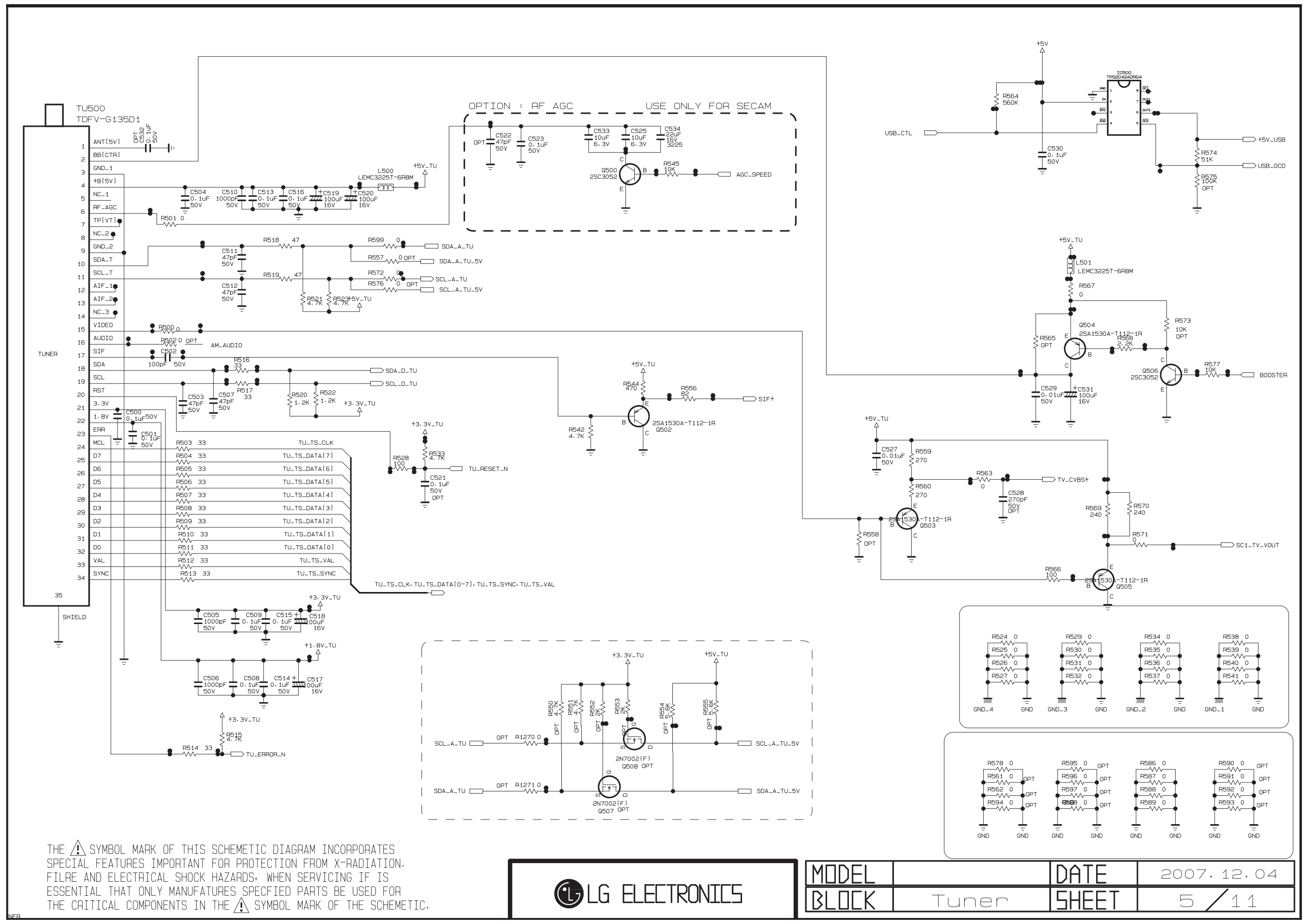
MODEL		DATE	2007. 12. 04
BLOCK	Module&Ctl	SHEET	4 / 11

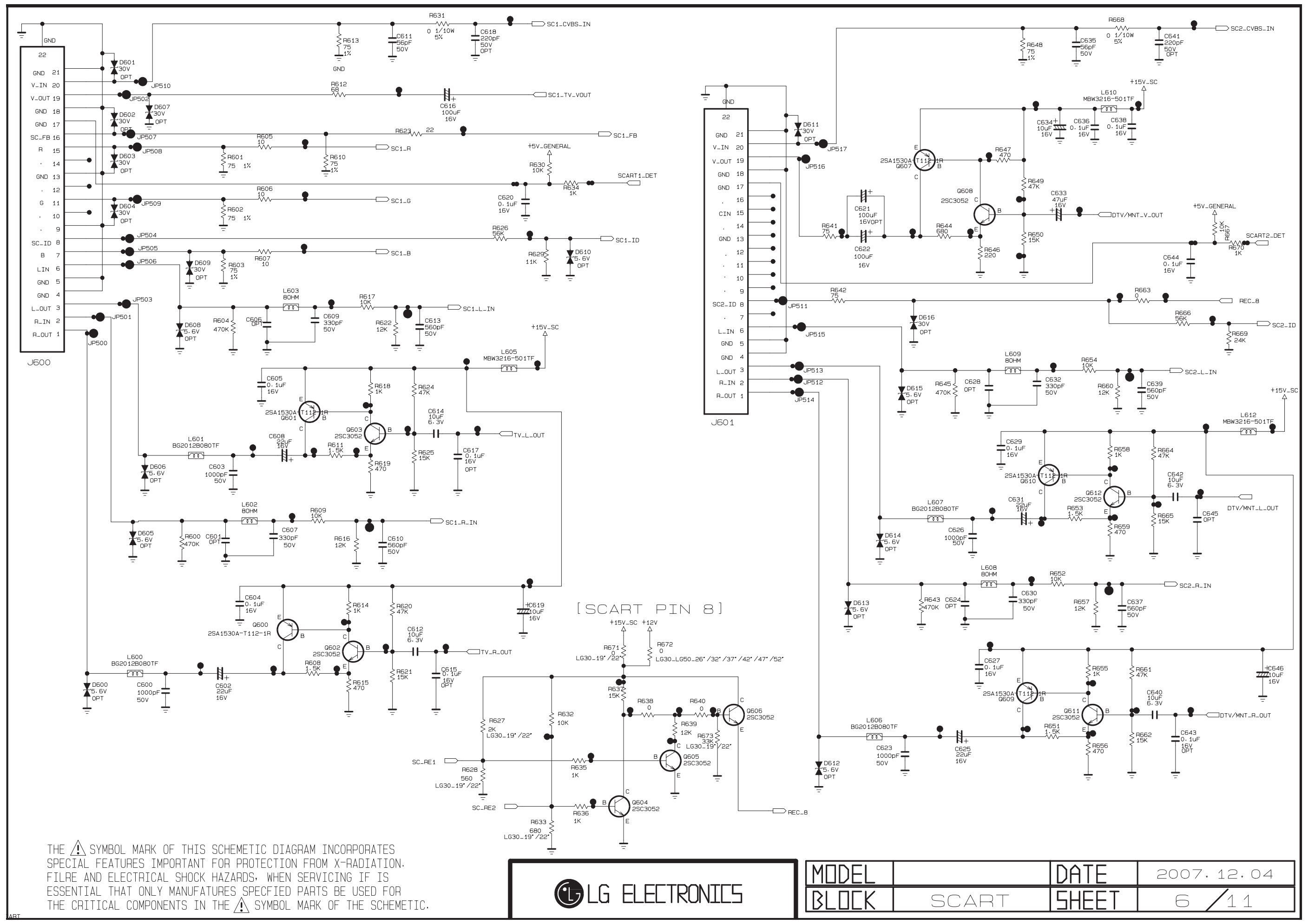


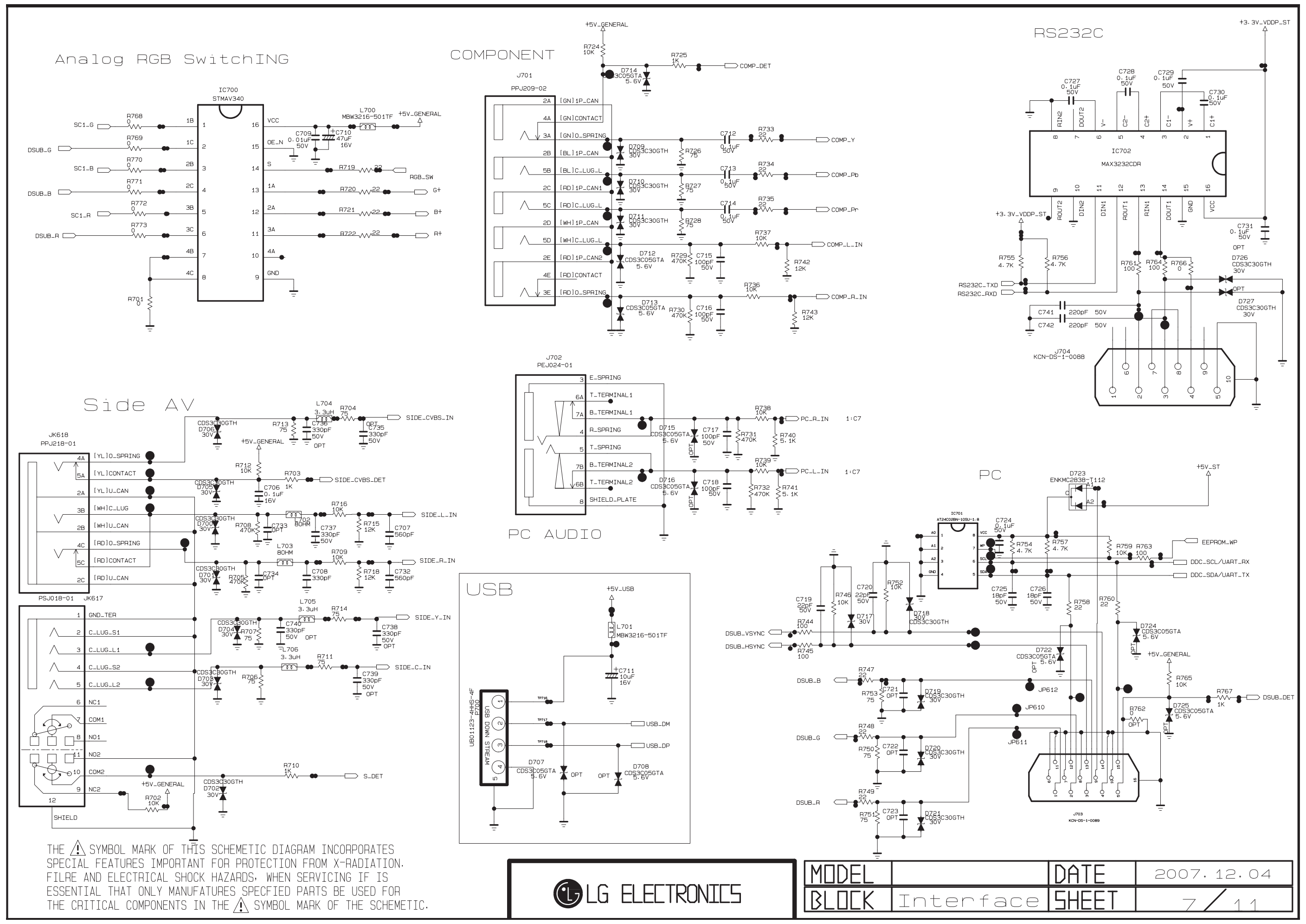
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

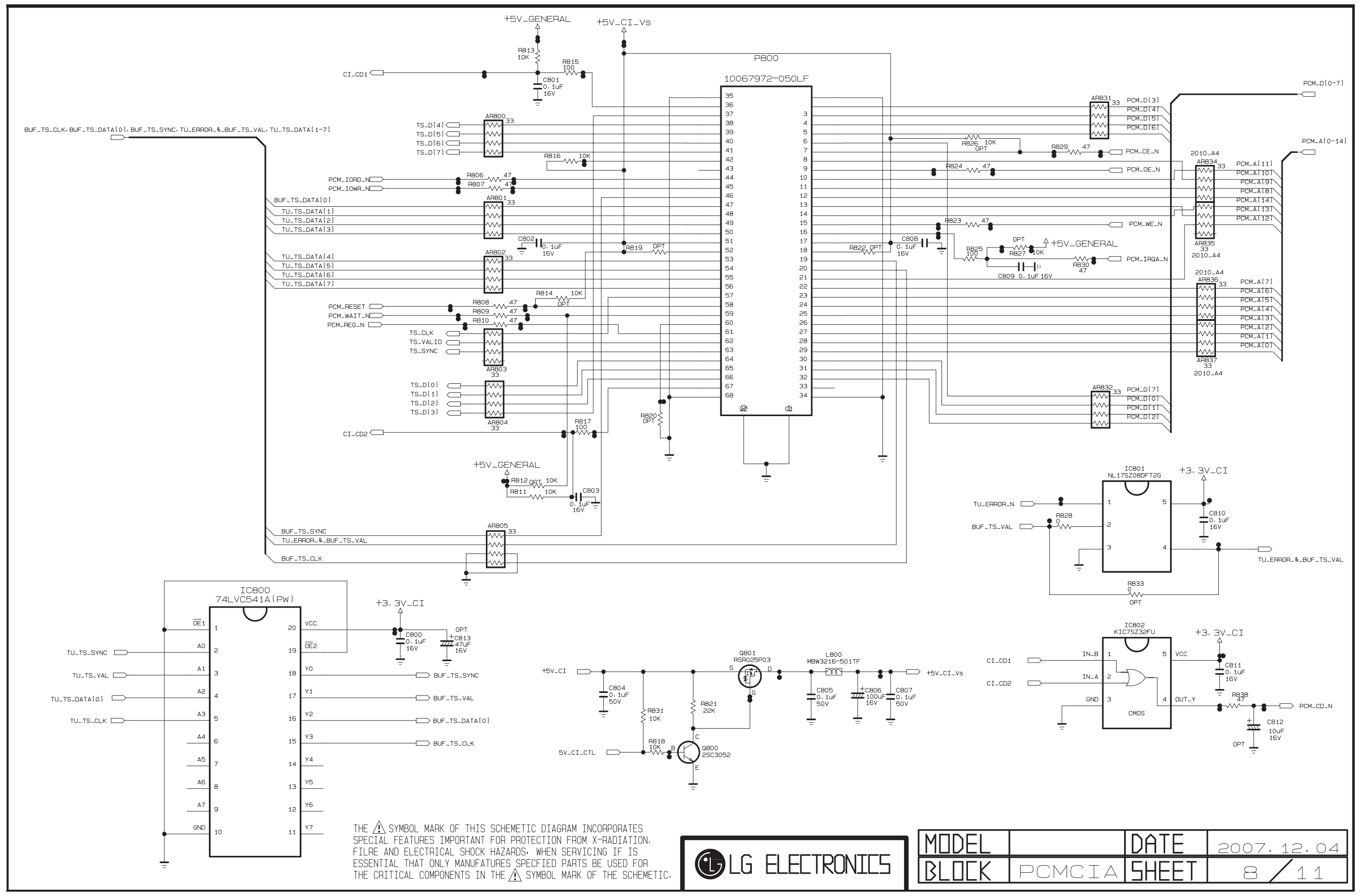
LG ELECTRONICS

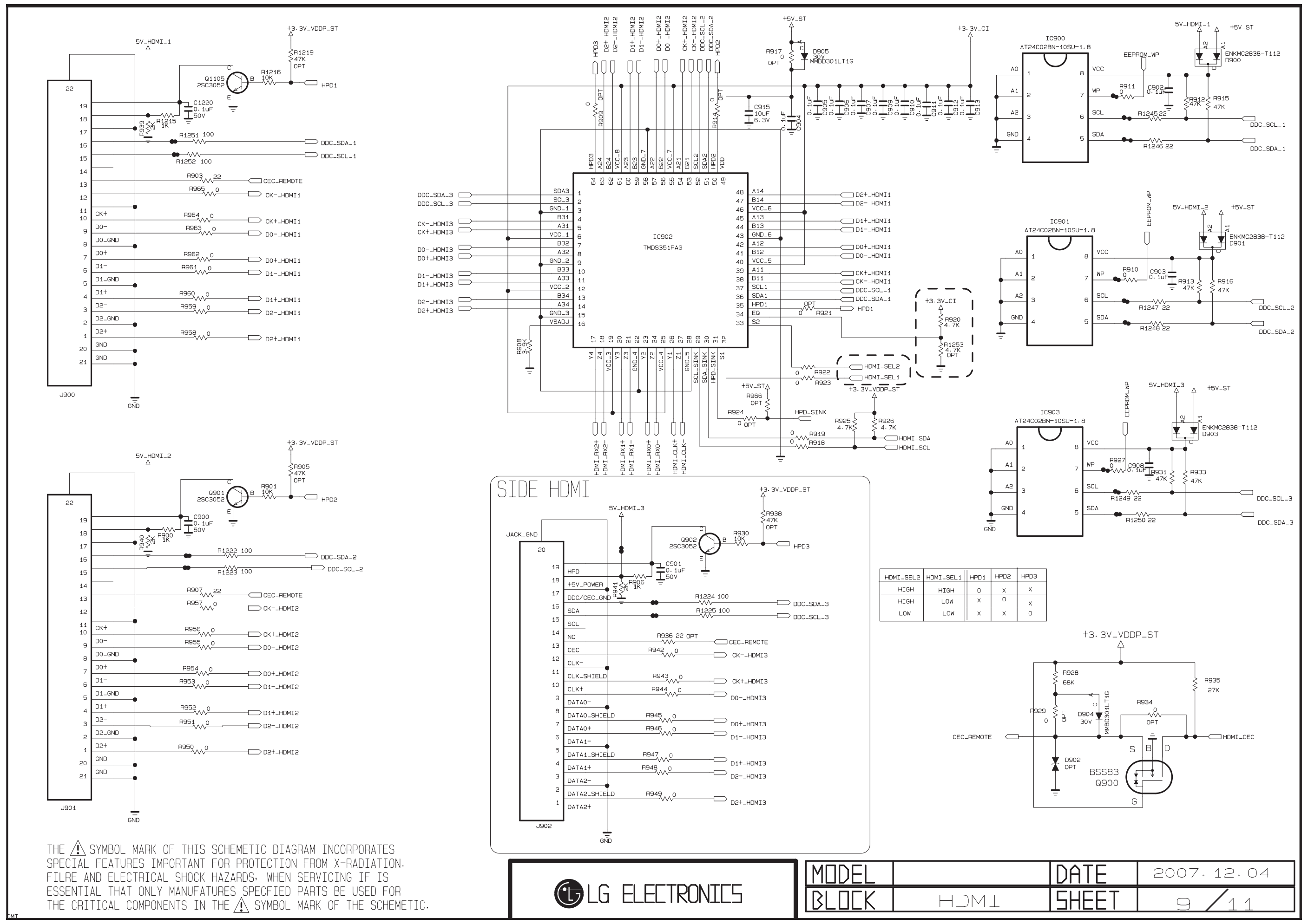
MODEL		DATE	2007. 12. 04
BLOCK	DDR	SHEET	3 / 11

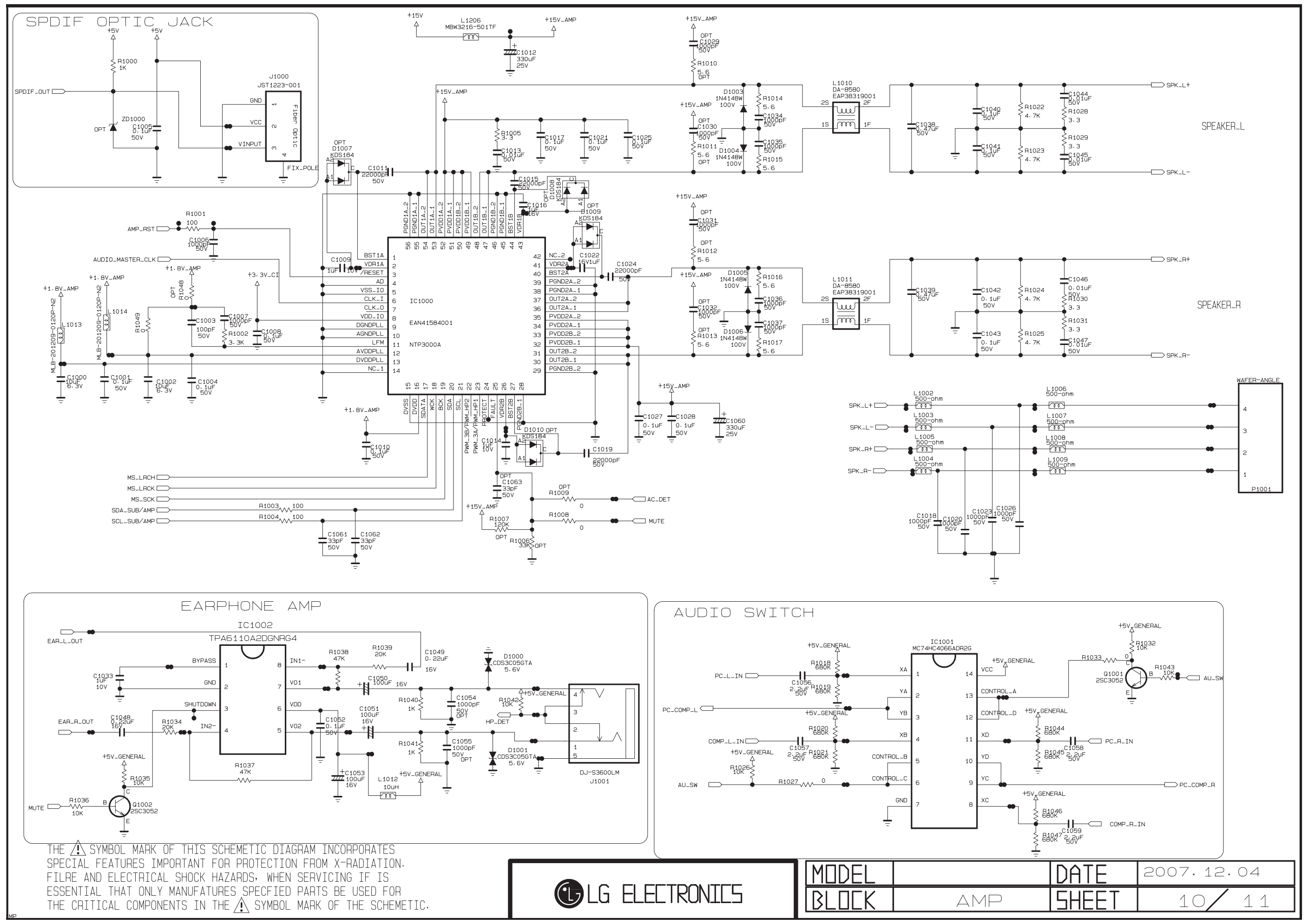

TU500
TDFV-G135D1
OPTION : RF AGC
USE ONLY FOR SECAM
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
DATE 2007.12.04
BLOCK Tuner
SHEET 5 / 11

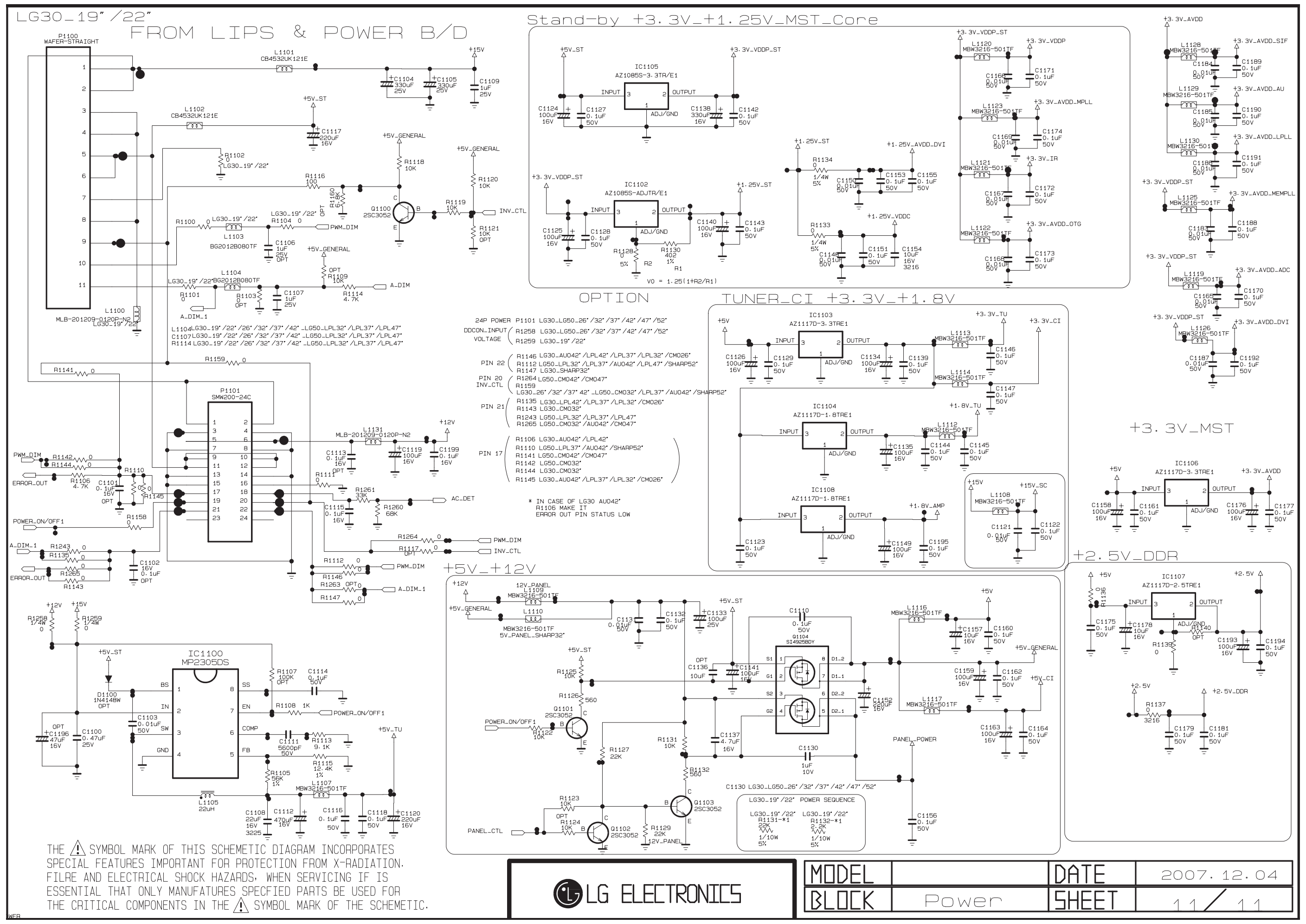

J600
J601
[SCART PIN 8]
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
DATE 2007.12.04
BLOCK SCART
SHEET 6 / 11


Analog RGB SwitchING
COMPONENT
RS232C
Side AV
PC AUDIO
PC
USB
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
DATE 2007.12.04
BLOCK Interface
SHEET 7 / 11


P800
10067972-050LF
IC800
74LVC541A(PW)
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
DATE 2007.12.04
BLOCK PCMCIA
SHEET 8 / 11


SIDE HDMI
THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
BLOCK HDMI
DATE 2007. 12. 04
SHEET 9 / 11


SPDIF OPTIC JACK
EARPHONE AMP
AUDIO SWITCH
SPEAKER_L
SPEAKER_R
THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
BLOCK AMP
DATE 2007. 12. 04
SHEET 10 / 11


LG30_19"/22"
FROM LIPS & POWER B/D
Stand-by +3.3V_+1.25V_MST_Core
OPTION
TUNER_CI +3.3V_+1.8V
+3.3V_MST
+2.5V_DDR
+5V_+12V
THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
LG ELECTRONICS
MODEL
BLOCK Power
DATE 2007. 12. 04
SHEET 11 / 11

LG Electronics Inc.

P/NO : MFL41037103

Jan., 2008
Printed in Korea